

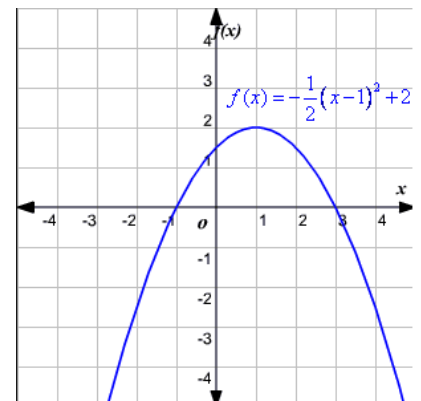
Name: _____

Algebra II Final Exam Review 2014-2015

SHOW ALL WORK ON SEPARATE SHEET

- Write the equation of an exponential function with initial value (0, 8) that passes through the point (2, 24).
- Simplify $\sqrt[3]{8^5}$
- Write an equation for an arithmetic sequence in which $t(2) = 5$ and $t(3) = 7$.
- For which value(s) of x is $\frac{x-3}{x^2-9}$ undefined?
- Mary purchased a new car for \$25,000. Each year it depreciates (loses value) at a rate of 6%. What will be its approximate value at the end of the third year?
- Simplify the expression $(3x^4yz^2)^{-2}$. No negative exponents or decimals.
- What is the value of the function $f(x) = x^2 - 8$ at $x = -2$?
- Write the equation $f(x) = x^2 - 4x + 1$ in graphing form (use the method of completing the square).
- What are the equations of the asymptotes of the hyperbola $f(x) = \frac{1}{x-3} + 4$?
- Write the equation of an absolute value graph opening downward with a vertex at (5, -3).
- What is the domain of the function $f(x) = \sqrt{x+3} - 2$?
- What are the coordinates of the vertex of the parabola $f(x) = x^2 - 2x - 3$?
- Solve for the x-intercepts of the equation $x^2 - 6x = -2$ (Hint: use the quadratic formula to solve!)
- Solve for x .

$$\frac{x-3}{x} + \frac{2}{x-1} = \frac{5-x}{x}$$
- Simplify the rational expressions $\frac{x^2-x-6}{x^2-9} \cdot \frac{x^2+5x+6}{x^2+4x+4}$
- Simplify the rational expressions $\frac{x^2-x-2}{4x^2-7x-2} \div \frac{x^2-2x-3}{3x^2-8x-3}$
- Solve the quadratic equation using the zero product property: $2x^2 + x - 6 = 0$
- Write an equation that represents the sequence 3, 9, 27, 81, ...
- What are the domain and range of the quadratic function shown on the graph?



- What is the coordinate of the y-intercept of the graph $f(x) = (x-3)^2 - 2$?

21. Write the expression $(x-4)(x+4)$ in standard form.

22. Solve the absolute value equation $-3|2-x|+2=-7$

23. Decide which value(s) of x are excluded $\frac{2x^2-x-3}{2x^2+x-6}$

24. Add the rational expression $\frac{x}{3x+1} + \frac{2x^2-2}{3x^2-14x-5}$

25. Simplify the rational expression completely. $\frac{5x^5y^3z}{4x^6yz^4} \div \frac{25x^2y^3z}{8xy^2z^3}$

26. Solve the radical equation $-2\sqrt{2x-6}+2=-8$

27. Write a quadratic equation with roots $-3 \pm 4i$

28. Write the equation of a parabola opening upward, shifted 5 units left and 3 units up.

29. Solve the equation $(x+2)^2+4=79$

30. Evaluate $|5+3i|$. (Hint sketching a graph on graph paper may help!)

31. Solve the quadratic equation $f(x)=x^2-3x+9$

32. Determine if the function is odd, even, or neither $f(x)=x^3+5x$

33. Draw the graph of the piecewise function:

$$f(x) = \begin{cases} 4-5x & \text{if } x \leq -2 \\ 0 & \text{if } -2 < x < 2 \\ x^2+1 & \text{if } x > 2 \end{cases}$$

34. A fireboat in the harbor is helping put out a fire in a warehouse on the pier. The distance from the barrel (end) of the water cannon to the roof of the warehouse is 120 feet, and the water shoots up 50 feet above the barrel of the water cannon.

- Draw a picture to model the situation (label important points!)
- Find an equation of the parabola that models the path of the water from the fireboat to the fire.
- Give the domain and range for which the function makes sense in relation to the fireboat.